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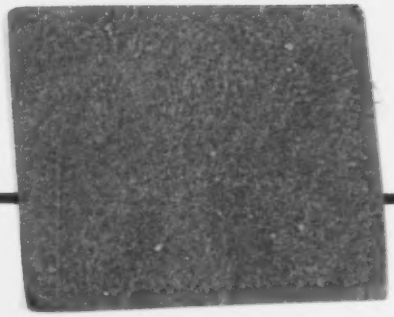

COMMITTEE ON THE PEACEFUL
USES OF OUTER SPACE

REPORT OF THE UNITED NATIONS EXPERT ON SPACE APPLICATIONS

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INTRODUCTION

1. At its thirty-fourth session, held at Vienna from 17 to 28 February 1997, the Scientific and Technical Subcommittee of the Committee on the Peaceful Uses of Outer Space reviewed the activities of the United Nations Programme on Space Applications. The Subcommittee noted that the 1996 activities of the Programme had been carried out satisfactorily, and that upon the recommendation of the Committee, the activities scheduled for 1997 had been endorsed by the General Assembly in its resolution 51/123 of 13 December 1996. The Subcommittee recommended to the Committee, for its approval, the activities scheduled for 1997 under the regular budget, and took note of other activities of the Programme, all of which were to be implemented as part of the space-applications-related recommendations of the Second United Nations Conference on the Exploration and Peaceful Uses of Outer Space (UNISPACE 82), as proposed by the Expert on Space Applications in his annual report (A/AC.105/660) submitted to the Scientific and Technical Subcommittee at its 1997 session. The present report reviews the steps taken to date to translate the mandate of the Programme into operational activities.

I. MANDATE OF THE PROGRAMME

2. The General Assembly, in its resolution 37/90 of 10 December 1982, took into account the recommendations of UNISPACE 82 and expanded the mandate of the Programme to include, in particular, the following elements: (a) provision of assistance in the development of indigenous capability at the local level; (b) provision of long-range fellowships for in-depth training; (c) provision of technical advisory services to member States and regional institutions upon request; (d) organization of regional and international training courses, seminars, workshops, conferences and technical expert meetings for the benefit of specialists, educators, managers and decision makers in order to enhance their technical capabilities and keep them abreast of ongoing developments in the discipline; (e) acquisition and dissemination of space-related information; and (f) promotion of greater cooperation between developed and developing countries, as well as among developing countries. Presented below are summaries of the activities carried out within the mandate of the Programme in 1997, those scheduled for implementation in 1998 and those proposed for 1999.

3. In paragraph 23 of its resolution 52/56 of 10 December 1997, the General Assembly agreed that the Third United Nations Conference on the Exploration and Peaceful Uses of Outer Space (UNISPACE III) should be convened at the United Nations Office at Vienna from 19 to 30 July 1999 as a special session of the Committee, open to all States Members of the United Nations. In its report on the work of its fortieth session, the Committee agreed that, as part of its programme of regular activities for 1998 and 1999, the Programme should organize regional preparatory meetings for the UNISPACE III Conference.[1] The organization of the special preparatory meetings would be carried out in consultation with Member States in each region. The programme of the preparatory meetings should contain elements from the annotated agenda of UNISPACE III Conference.

A. Regional preparatory meetings for the Third United Nations Conference on the Exploration and Peaceful Uses of Outer Space

4. Following the conclusion of the 1997 session of the Scientific and Technical Subcommittee, the Office for Outer Space Affairs consulted with Member States on the hosting of the UNISPACE III regional preparatory meetings. On the basis of subsequent consultations among Member States themselves, Chile, Malaysia and Tunisia offered to host the regional preparatory meetings for, respectively, Latin America and the Caribbean, Asia and the Pacific and Africa. The regional preparatory meetings, scheduled for 18 to 22 May 1998 (in Malaysia), 21 to 25 September 1998 (in Tunisia) and October 1998 (in Chile), will be issues-oriented, with the focus on elements of the agenda of the UNISPACE III Conference. The concerns of Member States in each region will be brought to the attention of the UNISPACE III Conference. The outcome of the meetings will thus

serve as input for the draft report of the Conference. The outline prepared for the programme of the meetings is contained in annex I to the present report.

B. Development of indigenous capability

5. A major prerequisite to successful space technology applications, in the developing countries, is the development of various essential indigenous capacities, particularly human resources, within each region. In recognition of such a prerequisite, the General Assembly, in its resolution 45/72 of 11 December 1990, endorsed the recommendation of the Working Group of the Whole of the Scientific and Technical Subcommittee, as endorsed by the Committee, that:

> "... the United Nations should lead, with the active support of its specialized agencies and other international organizations, an international effort to establish regional centres for space science and technology education in existing national/regional educational institutions in the developing countries" (A/AC.105/456, annex II, para. 4 (n)).

6. The General Assembly, in its resolution 50/27 of 6 December 1995, endorsed the recommendation of the Committee that "these centres be established on the basis of affiliation to the United Nations as early as possible and that such affiliation would provide the centres with the necessary recognition and would strengthen the possibilities of attracting donors and of establishing academic relationships with national and international space-related institutions".

7. The General Assembly, in paragraph 21 of its resolution 52/56 of 10 December 1997, noted with satisfaction that the Centre for Space Science and Technology Education in Asia and the Pacific, affiliated to the United Nations, had continued its education programme in 1997 and that significant progress had been achieved in establishing regional centres for space science and technology education in the other regions.

1. Regional centres for space science and technology education

(a) Africa

8. Morocco (host of the centre for French-speaking African countries) will shortly be circulating the draft agreement on the centre to be hosted by it, for the review, comments and concurrence of French-speaking African countries. The inauguration of the centre will follow immediately upon the completion of that process. Nigeria (host of the centre for English-speaking African countries) has completed the circulation of the draft agreement on the centre to be hosted by it on behalf of the English-speaking African countries. The inauguration of the centre is scheduled for March 1998.

(b) Asia and the Pacific

9. The Centre for Space Science and Technology Education in Asia and the Pacific has successfully conducted two courses on remote sensing and geographic information systems (GIS) (April-December 1996 and October 1997-June 1998) and its first satellite communications course (January-September 1997). The first course on satellite meteorology and global climate, conducted by the Centre for a period of nine months, is scheduled to begin on 1 March 1998 at the Space Applications Centre, Ahmedabad, India, and will be launched with a four-day workshop on the same subject. Upon completion of their nine-month course in each activity, the candidates are scheduled to carry out a one-year applications project in their home country. The Programme is working closely with the Governing Board of the Centre for each activity, including the anticipated launching, in the immediate future, of a long-term course on basic space science, as the fourth element of the programme of the Centre.

(c) Latin America and the Caribbean

10. In November 1997, the Committee on Science and Technology of the Parliament of Brazil approved the agreement on the centre for Latin America and the Caribbean, which has been signed by the Governments of Brazil and Mexico. Upon the concurrence of the full Parliament, the centre will be inaugurated and its programmes initiated. The initial long-term (nine-month) programme of the centre will focus on: (a) remote sensing and GIS; and (b) satellite meteorology. Short-term activities (one to four weeks) in the form of workshops, seminars and conferences on communications and basic space science will be undertaken until the centre has matured enough to upgrade those activities to long-term (nine-month) education programmes.

(d) Western Asia

11. An evaluation mission, scheduled for the first quarter of 1998, will assess the facilities and resources being proposed for the centre for western Asia by three potential host countries, namely, Jordan, Saudi Arabia and Syrian Arab Republic.

(e) Network for central eastern and south-eastern European countries

12. At the fortieth session of the Committee on the Peaceful Uses of Outer Space, held in 1997, the delegations of Bulgaria, Greece, Poland, Romania, Slovakia and Turkey reiterated their commitment and agreement to establish a network of space science and technology education and research institutions for States of central eastern and south-eastern Europe,[2] to be preceded by a technical evaluation mission conducted under the aegis of the Programme. The mission would determine the technical requirements, design, operation mechanism and funding of the network. It is anticipated that the technical evaluation mission will take place early in 1998. Furthermore, in July 1997, Hungary conveyed to the United Nations its decision to join the network.

C. Long-term fellowship programmes for in-depth training

13. The Programme received four long-term fellowship offers for the period 1997-1998 from the European Space Agency (ESA). The status of the awards for the period 1997-1998 is reflected in annex II of the present report. The fellowship awards cover monthly allowances for room and board, books, local travel and health benefits. The focus of the fellowship activities offered are described below.

14. The four ESA long-term fellowships are each for a period of one year of research and study at ESA institutions in the following disciplines:

(a) One fellowship in Space Antennas and Propagation and one in Remote Sensing Instrumentation, tenable at the European Space Research and Technology Centre at Noordwijk, Netherlands;

(b) Two fellowships in Remote Sensing Information Systems, tenable at the European Space Research Institute at Frascati, Italy.

15. The fellowship awards for the period 1997-1998 were advertised in December 1997. Selected candidates will begin their studies in January 1998 at the above-mentioned ESA institutions.

16. The fellowship programme initiated by the Programme in 1985 in Brazil at the Instituto Nacional de Pesquisas Espaciais has fully matured through its financial co-sponsorship by the United Nations University; its operation is now being managed by the two institutions. The 10 annual fellowships from the Government of Brazil are for studies in remote sensing with emphasis on research and applications, particularly for

participants from Latin America. The eleventh course in the series was completed in December 1997, with 12 participants from six countries (Brazil, Colombia, Cuba, Ecuador, Mexico and Venezuela) in attendance.

D. Technical advisory services and promotion of regional cooperation

17. Various technical advisory services currently being rendered under the auspices of the Programme are described below.

1. Cooperative information network linking scientists, educators, professionals and decision makers in Africa

18. At the working meeting of the cooperative information network linking scientists, educators, professionals and decision makers in Africa (COPINE), held at Windhoek from 19 to 23 May 1997, technical experts from Africa and Europe and representatives of the Office for Outer Space Affairs and the Economic Commission for Africa (ECA) reviewed the COPINE draft document and carried out a detailed analysis of the planned and other projected uses of COPINE services in the participating African countries. The project document was refined by two consultants and subsequently presented for review to the COPINE Governing Board prior to its meeting held at Helsinki on 7 and 8 July 1997. The Board concluded its deliberations on the project document with an endorsement contained in the resolution presented in annex III of the present report.

19. In its statement of approval of the project document, the Governing Board concluded that COPINE is needed, relevant and timely as an important vehicle for promoting the socio-economic development of African countries. The Governing Board welcomed and accepted the offer of the Netherlands to host the COPINE provisional secretariat, which will serve as a focal point for the finalization of the preparatory activities for launching the project. Those activities include: consolidation of European participation in the project, particularly in the funding aspect; involvement of European cooperating institutions; activation of the COPINE user community; preparation of a detailed implementation plan for COPINE in African countries; establishment of partnership ventures between European and African companies; and early demonstration of the capabilities of the COPINE system. The Governing Board also concluded that the Office for Outer Space Affairs should assist in defining the responsibilities arising from the above-mentioned tasks and should cooperate closely with African countries in preparing a detailed plan for the implementation of COPINE in the countries concerned.

20. A meeting of the Governing Board, held at Darmstadt, Germany, in December 1997, agreed on tasks to be performed and the resources to be made available for the completion of the COPINE preparatory activities, and took action on the following: the COPINE implementation plan for Africa; industry activity related to a financial plan and sustainability of the project; the role of the Institute for Communication and Development at The Hague as the COPINE secretariat; and the legal framework for the COPINE project.

2. Follow-up activities to the United Nations/European Space Agency basic space science workshop series

21. The Programme has also undertaken modest steps in exposing youth, on a regional basis, to the immense expanse of outer space and in developing their understanding of their place in that environment. The Programme worked closely with ESA to organize a series of workshops between 1991 and 1997 on basic space science, including the use of telescopes for space missions and ground-based and space-borne astronomy, as well as small astronomical telescopes and satellites in education and research. The follow-up projects undertaken under the auspices of the Programme on this aspect of its work are outlined in annex IV of the present report.

3. Asia-Pacific Satellite Communications Council

22. The Asia-Pacific Satellite Communications Council (APSCC), established and inaugurated at Seoul in October 1994 with the support of the Programme, continues to make much progress within the region. Its 1996 conference placed special emphasis on the contribution of satellite technology to the global information infrastructure. The growing recognition of APSCC since its establishment has resulted in its broad international membership, which currently stands at 60. The most recent accomplishment of APSCC was its proposal to the International Telecommunication Union World Radiocommunication Conference of 1997 on the modification of the multilateral coordination approach, particularly for administrations that are having difficulty in accessing the unplanned C-, Ku- and Ka-bands. In that connection, APSCC submitted to the Conference, through the Marshall Islands, a memorandum of understanding for multilateral coordination meetings.

4. Follow-up to the United Nations/Sweden course for educators

23. A workshop to evaluate the impact of the United Nations/Sweden series of courses on remote sensing education for educators, held annually in Sweden since 1990, except in 1991, and to determine the future direction of the course will be held at Gaborone, Botswana, in October 1998.

5. Follow-up activities to the United Nations/European Space Agency sponsored training courses

24. At the request of the participants in the series of sponsored training courses, the United Nations and ESA have jointly initiated a technical assistance programme that would strengthen the capability of a number of institutions in developing countries. The programme would make it possible for the institutions of the participants to obtain satellite radar and optical data to support ongoing projects in their countries as well as to provide hands-on training in the use of the data. Where necessary, the programme would also provide software modules and hardware components in order that the data could be analysed and subsequently utilized.

25. In addition, through the technical assistance programme, participants should be able to present to their respective decision makers, in management terms, the value as well as the cost-effectiveness of utilizing satellite data in the planning and management of future projects.

26. In preparation for the technical assistance programme, the data needs of several ongoing projects have been sent to the United Nations and ESA by participants in the first two training courses held at the facilities of the ESA European Space Research Institute (ESRIN) at Frascati, Italy. In formulating the programme, the submissions from Latin America and those received from the region of Asia and the Pacific have been integrated thematically into modules which the co-sponsors will present to potential donor partners. A similar process is currently under way for the submissions being received from African participants in courses jointly organized by the United Nations and ESA both at Frascati and in Africa.

6. Committee on Earth Observation Satellites

27. At its plenary meeting held at Toulouse, France, from 19 to 21 November 1997, the Committee on Earth Observation Satellites (CEOS) endorsed a proposal submitted by the Indian Space Research Organization, entitled "Changing face of the Earth: an Earth observation treatise". The main aim of the proposal is to review the efforts of space agencies and user organizations in the past 25 years, assess the capabilities of Earth observation systems and develop an invaluable reference document. Accordingly, the proposal will serve as a treatise on the contributions to human society of Earth observation systems, including a total stocktaking of Earth observation data and applications. Contributing to the implementation of the CEOS proposal are all the space agencies and organizations using Earth observation data as well as the Office for Outer Space Affairs. Through the United Nations Programme on Space Applications, the Office has a closer perspective on the needs

of developing countries. The contributions of the Office to the CEOS proposal will be of significant value to the ongoing efforts of the Programme to assist Member States, particularly in those activities that are aimed at building awareness and transmission of knowledge.

E. Training courses, workshops, conferences and symposia organized by the United Nations

1. Activities carried out in 1997

28. In 1997, six workshops, two training courses and one symposium were conducted under the auspices of the Programme. A summary of each of these activities is given in annex V to the present report.

2. Activities scheduled for implementation in 1998

29. The training courses, workshops, conferences and symposia scheduled for 1998 are shown in annex VI.

3. Activities proposed for implementation in 1999

30. The following activities are proposed for 1999:

(a) UNISPACE III and related activities;

(b) Ninth United Nations/Sweden International Training Course on Remote Sensing Education for Educators (May/June 1999);

(c) Third United Nations/United States of America International Conference on Spin-off Benefits of Space Technology: Challenges and Opportunities;

(d) United Nations/ESA Workshop on Basic Space Science: World Space Observatory (January 1999).

F. Space information

31. The eighth in the series of selected papers from the activities of the Programme, entitled *Seminars of the United Nations Programme on Space Applications* (A/AC.105/650), has been issued. The third edition of the directory entitled *Education, Training, Research and Fellowship Opportunities in Space Science and Technology* (A/AC.105/671) has also been issued.

32. Information for Member States and the general public on the latest developments in the activities carried out by the Programme can be found on the home page of the Programme established on the Internet as part of the home page of the Office for Outer Space Affairs. This home page is accessible through the World Wide Web using the address http://www.un.or.at/OOSA/sapiax.html and it contains information on activities that have been implemented as well as reports and press releases issued within the framework of the Programme. The schedules, objectives and programmes of planned activities and projects are also included in the home page.

II. VOLUNTARY CONTRIBUTIONS

33. The successful implementation of the activities of the Programme in 1997 benefited from the support and voluntary contributions of States Members of the United Nations and their institutions, as well as from the assistance and cooperation of regional and other international governmental and non-governmental

organizations. In 1997, the Programme received voluntary contributions, both in money and in kind, including the sponsorship of technical and scientific presentations by several experts, as described below.

34. A number of Member States (Austria, Brazil, Honduras, India, Israel, Italy, Namibia, Philippines and Sweden) and governmental and non-governmental organizations (Department of Development Support and Management Services of the Secretariat, Austrian Space Agency, Committee on Space Research (COSPAR), European Commission, ESA, ESRIN, Instituto Nacional de Pesquisas Espaciais of Brazil, International Astronautical Federation, Italian Space Agency, S. Neaman Institute and the Planetary Society) provided support for the activities of the Programme in 1997 in various ways, including the following:

(a) Defraying the local expenses of candidates from developing countries in the long-term fellowship programmes (see annex II);

(b) Voluntary cash contributions received in 1997 from the Governments of Austria ($25,000) and the Philippines ($2,500) in support of the activities of the Programme;

(c) A financial contribution of $136,000 received from ESA in support of specific 1997 activities of the Programme as reflected in annex IV. Part of this contribution is earmarked for the COPINE Training Course rescheduled for 1998;

(d) Defrayal - by the Government of Austria, the province of Styria and the city of Graz - of the costs of air travel, per diem, accommodation of participants and the necessary logistics in support of the organization of the United Nations/Austria/European Space Agency Symposium on Space Industry Cooperation with the Developing World, held at Graz, Austria, from 8 to 11 September 1997;

(e) Defrayal by the Government of Sweden and the Swedish International Development Agency of the cost of organizing the Seventh United Nations/Sweden Training Course on Remote Sensing Education for Educators, and of course materials and living expenses for participants, as well as air travel for 14 participants to attend the Training Course;

(f) Co-sponsorship of the activities of the Programme and, in particular, defrayal of the costs of international air travel of participants, local organization and facilities, room and board, and local transportation (see annex V);

(g) Sponsorship (travel and daily subsistence allowance) of experts from Member States to make technical presentations and take part in deliberations on the activities of the Programme (see annex V).

III. FINANCIAL PROVISIONS AND ADMINISTRATION OF ACTIVITIES IN 1998

35. The activities of the Programme in 1998 covered in the present report will be implemented as follows:

(a) *Financial provisions.* Under the United Nations regular budget, a sum of $488,200 was proposed in the programme budget presented to the General Assembly at its fifty-second session for implementing the activities of the Programme during the biennium 1998-1999. In order to effectively carry out its mandated and expanded activities, it has become necessary for the Programme to solicit additional funds, in the form of voluntary contributions, in support of its activities. Those contributions will be used to supplement the regular budget of the Programme;

(b) *Administration by and contributions and participation of staff.* The Office for Outer Space Affairs, and in particular the Expert on Space Applications and his staff, will carry out the activities described in the present report. In that connection, travel will be undertaken as appropriate by the Expert and his staff under the provisions of the travel budget of the Office for the biennium and as necessary from voluntary contributions.

Notes

[1]*Official Records of the General Assembly, Fifty-second Session, Supplement No. 20* (A/52/20), para. 153.

[2]Ibid., para. 58.

Annex I

PROGRAMME OF THE REGIONAL PREPARATORY MEETINGS FOR THE UNISPACE III CONFERENCE

MONDAY	*TUESDAY*	*WEDNESDAY*	*THURSDAY*	*FRIDAY*
0815-0900 Registration of delegations 0900-1000 Opening session Review of conference procedure 1000-1020 break 1020-1230 Presentation of issues: environment/natural resources (theme 2); natural disasters (theme 1) Background papers: 1, 2, 3, 11, 12	0900-1120 Presentation of issues: space communications (theme 2); navigation and precise location systems (theme 1) 1120-1140 break 1140-1230 Consideration of issues Background papers: 4, 5, 11, 12	0900-1120 Presentation of issues: information needs (theme 1); spin-off benefits (theme 1); space commercialization (theme 1) 1120-1140 break 1140-1230 Consideration of issues Background papers: 7, 8, 11, 12	0900-1120 Presentation of issues: education (theme 1); space science (theme 1); micro-satellites (theme 1) 1120-1140 break 1140-1230 Consideration of issues Background papers: 6, 9, 10, 11, 12	0900-1230 Technical visit
Lunch	Lunch	Lunch	Lunch	Lunch
1400-1700 Consideration of issues 1900 Reception	1400-1530 Consideration of issues 1530-1550 Break 1550-1700 Consideration of issues	1400-1530 Consideration of issues 1530-1550 Break 1550-1700 Consideration of issues	1400-1530 Consideration of issues 1530-1550 Break 1550-1700 Draft report of recommendations	1400-1530 Consideration and adoption of the draft report 1530-1550 Break 1550-1630 Closing session

Notes: The issues will be those of interest to Member States (in particular, developing countries) and will include, among others, those which relate to the following principal themes: (1) the economic and societal benefits of space technologies; (2) international cooperation to resolve regional to global issues; and (3) the special needs of developing countries. Each presentation of issues should be of a maximum duration of 45 minutes, inclusive of discussion.

The background papers will deal with the following topics: (1) the Earth and its environment in space; (2) disaster prediction, warning and mitigation; (3) management of Earth resources; (4) satellite navigation and location systems; (5) space communications and applications; (6) basic space science and microgravity research and their benefits; (7) commercial aspects of space exploration including spin-off benefits; (8) information systems for research and applications; (9) small satellite missions; (10) education and training in space science and technology; (11) economic and societal benefits; and (12) promotion of international cooperation.

Annex II

LONG-RANGE FELLOWSHIPS OFFERED BY THE EUROPEAN SPACE AGENCY WITHIN THE FRAMEWORK OF THE UNITED NATIONS PROGRAMME ON SPACE APPLICATIONS, 1997-1998

Period	*Country or organization*	*Subject*	*Financial support by host country or organization*	*Fellowships offered*	*Candidates selected*	*Applications submitted*	*User countries (one or more candidates*
1997/1998	ESA	Space antennas and propagation	Subsistence allowance	1	1	19	India
1997/1998	ESA	Remote sensing information systems	Subsistence allowance	2	2	40	Egypt Nigeria
1997/98	ESA	Remote sensing instrumentation	Subsistence allowance	1	1	18	Azerbaijan

Annex III

RESOLUTION ADOPTED BY THE COPINE PROVISIONAL GOVERNING BOARD MEETING AT HELSINKI ON 8 JULY 1997

In response to initiatives emanating from African countries (at the United Nations Conference on Environment and Development, held at Rio de Janeiro, Brazil, from 3 to 14 June 1992, and at meetings convened at Dakar in 1993 and at Addis Ababa in 1995), the COPINE project was launched through the United Nations. Since February 1995, the Provisional Governing Board of COPINE has initiated and sustained progress in designing the COPINE proposal. At its meeting held at Helsinki on 8 July 1997, the Provisional Governing Board of COPINE adopted the resolution presented below.

*COPINE: achieving development priorities through improved information exchange networks in Africa**

The Provisional Governing Board of COPINE,

1. *Notes*:

(a) That isolation is a major development constraint in Africa, especially in the rural areas, and that without access to information technology, both the ability to communicate and gain access to the information base, most African countries, and especially their rural areas, will be further marginalized;

(b) That information technology can stimulate development, particularly in the rural areas, on a cost-effective basis such as in schools, clinics and on farms;

(c) That a practical approach to providing access to information technology has been developed through COPINE which will permit African partner countries to build information technology capabilities to support their development, based on their own assessment of needs on a financially sustainable and future compatible basis.

2. *Further recognizes*:

(a) The needs expressed by the African institutions for information and communication technology and the potential of this technology in enhancing balanced development;

(b) The merits of the preparatory work undertaken by active commitment by experts from Africa and Europe;

(c) The iterative process between experts from Africa and Europe at a scale and coherence proportional to the needs;

(d) The instrumental functions of the COPINE concept for securing institutional memory of development programmes;

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3. *Appreciates*:

(a) The unique potential of COPINE, as a partnership programme between African and European countries, to turn developmental priorities into achievable targets, and the complementarity of this to the existing initiatives;

(b) The unique feature of COPINE as a partnership model between African and European countries;

4. *Welcomes and accepts*: the offer of the Netherlands to host the COPINE provisional secretariat;

5. *Concludes*:

(a) That the COPINE project is a viable concept for meeting urgent developmental needs and that it is a necessary vehicle to enable Africa to participate in the continuing globalization processes;

6. *Recommends*:

(a) That the donor countries maintain the momentum of COPINE, through the secretariat hosted by the Netherlands, and that the African partner countries be assisted to undertake the detailed planning of implementation;

(b) That the donor countries seek appropriate means to support the programme;

(c) That the African countries approach the donor delegations where appropriate;

(d) That the secretariat establish contact at decision-making level with the countries participating in COPINE.

Annex IV

OVERVIEW OF THE SERIES OF UNITED NATIONS /EUROPEAN SPACE AGENCY BASIC SPACE SCIENCE WORKSHOPS

Year	*Target region*	*Topic/subtopic of the workshop, venue and host country*	*Recommendation for follow-up project contained in the report on the workshop and key issues considered*	*Status of implementation*
1991	Asia and the Pacific (Economic and Social Commission for Asia and the Pacific)	Basic space science (Bangalore, India)	Establishment of an astronomical facility in Sri Lanka recommended (see document A/AC.105/105/489)	Observatory facilities were provided by Sri Lanka and an optical telescope was donated by the Government of Japan.
1992	Latin America and the Caribbean (Economic Commission for Latin America and the Caribbean)	Basic space science (San José, Costa Rica and Bogotá, Colombia)	(a) Establishment of the Astronomical Observatory for Central America recommended (b) Establishment of a Radiotelescope in Colombia recommended (see document A/AC.105/530)	Optical telescope was acquired by the Government of Honduras and other facilities at the Observatory were supported by Spain and the European Commission. The Observatory was inaugurated in 1997. Radio telescope was acquired with the support of institutions from Brazil, Italy, Spain and United States, as well as the Government of Colombia.
1993	Africa (Economic Commission for Africa)	Basic space science (Lagos, Nigeria)	Establishment of the Inter-African Astronomical Observatory and Science Park in Namibia recommended (see document A/AC.105/560/Add.1)	Pending
1994	Western Asia (Economic and Social Commission for Western Asia)	Basic space science (Cairo, Egypt)	(a) Refurbishment of the Kottamia Telescope recommended (b) Participation of Egypt in the United States/Russian Federation Mars Mission 2001 recommended (see document A/AC.105/580)	Equipment and materials were provided by Egypt and entities from Germany. Work progressing with contribution from Egypt, Russian Federation, United States and the Planetary Society.
1996	Eastern and Western Europe (Economic Commission for Europe)	Ground-based and space-borne astronomy (Bonn, Germany)	The Workshop reviewed the achievements of the whole series of United Nations/ESA workshops and the establishment of a Working Group on Basic Space Science in Africa (see document A/AC.105/657).	The development and production of a basic space science newsletter for Africa is being implemented with the support of France and South Africa.

Annex V

SUMMARY OF UNITED NATIONS TRAINING COURSES, WORKSHOPS AND SYMPOSIA HELD IN 1997

Title, location and date	*Sponsoring country/ organization (host institute)*	*(a) Funding and nature of support* *(b) Number of participating countries and organizations* *(c) Total number of participants*	*Outcome of activity*
United Nations/ European Space Agency Workshop on Distance Education and Training via Satellite in cooperation with the Centre for Space Science and Technology Education for Asia and the Pacific (CSSTE-AP) Ahmedabad, India 20-24 January 1997	Government of India, United Nations and ESA (CSSTE-AP, Indian Space Research Organisation (ISRO))	(a) Air travel and subsistence for 14 participants (United Nations and ESA); other expenses and facilities (CSSTE-AP, ISRO) (b) 15 countries (c) 22 participants	The Workshop addressed different aspects of distance education via satellite including teleconferencing, local broadcasting, programme development and production including software and hardware systems, and experiences of users in educational radio. The Workshop also addressed indigenization and cost implications of these processes. The Workshop concluded with a recommendation that the Centre, with its headquarters at Dehradun, should initiate a tele-education programme linking the countries of Asia and the Pacific
Seventh United Nations/ Sweden International Training Course on Remote Sensing Education for Educators Stockholm and Kiruna, Sweden 5 May-13 June 1997	Government of Sweden and United Nations (Stockholm University, Swedish Space Corporation, SSC Satellitbild)	(a) Air travel (United Nations and Sweden); all other expenses (Swedish International Development Agency (SIDA), Sweden) (b) 20 countries (c) 27 participants	The following recommendations made by the participants were aimed at improving the Course to make it even more responsive to evolving needs in their countries and academic institutions: (a) the parts of the Course dealing with visual image interpretation and remote sensing curricula should be shortened; (b) the parts of the Course dealing with digital image processing, geographic information systems (GIS), radar and cost-benefit analysis should be expanded; (c) the availability of satellite images of their home countries requested by participants for use during the Training Course should be improved; (d) the amount of free time allowed to participants to review the copious volume of technical material presented during lectures should be increased. The Office for Outer Space Affairs, Stockholm University and SIDA are currently reviewing the above recommendations, including the feasibility of holding a more advanced course for educators in remote sensing. (Detailed report contained in document A/AC.105/678.)

Title, location and date	*Sponsoring country/ organization (host institute)*	*(a) Funding and nature of support* *(b) Number of participating countries and organizations* *(c) Total number of participants*	*Outcome of activity*
COPINE: Workshop on Information Network in Africa Windhoek, Namibia 19-23 May 1997	Government of Namibia, United Nations and ESA (University of Namibia)	(a) Air travel and subsistence for five participants (United Nations and ESA); conference facilities (University of Namibia) (b) 15 countries and organizations (c) 22 participants	Technical experts from Africa and Europe (as well as from ECA and the Office for Outer Space Affairs) reviewed the draft COPINE document and carried out detailed investigations of the planned uses of COPINE services in Namibia. The uses of COPINE in Ghana, Nigeria, South Africa and the United Republic of Tanzania were also reviewed with a view to quantifying traffic flows and system configurations at the national level as well as determining network sustainability. The project document would be refined with the aid of two consultants from companies based in the United Kingdom who were present at the Namibia meeting. The revised document would be presented to the provisional COPINE Governing Board at its meeting scheduled for July 1997 in Finland.
Seventh United Nations/ European Space Agency Workshop on Basic Space Science: Small Astronomical Telescopes and Satellites in Education and Research Tegucigalpa, Honduras 16-20 June 1997	Government of Honduras, United Nations, ESA and the Planetary Society (Observatorio de Astronomia de la Universidad Nacional Autónoma de Honduras)	(a) Air travel and subsistence for 24 participants (United Nations and ESA), additional support by other organ-izations as reflected in the report of the Workshop; facilities, equipment and local transportation (Honduras) (b) 28 countries (c) 80 participants	The Astronomical Observatory for Central America at Tegucigalpa was inaugurated. As part of the inauguration activity of the astronomical observatory at the Observatorio Astronómico de la Universidad Nacional Autónoma de Honduras, the United Nations, in cooperation with ESA, organized this Workshop focusing on small astronomical telescopes and satellites in education and research. (Detailed report contained in document A/AC.105/682.)
United Nations/Austria/ European Space Agency Symposium on Space Industry Cooperation with Developing Countries Graz, Austria 8-11 September 1997	Government of Austria, United Nations and ESA (Province of Styria, City of Graz)	(a) Air travel and daily subsistance allowance (DSA) for 28 participants and other expenses (Austria, United Nations and ESA) (b) 26 countries, 9 national and international organizations and representatives from 9 companies (c) 96 participants	The Symposium focused on the role of space industry in providing services for infrastructure improvement and in transferring space technology to developing countries. Symposium participants including representatives from the industry explored possibilities for increased scientific and technical cooperation between industrialized and developing countries as well as among developing countries themselves. It was noted that joint ventures between companies from the developing world and industry from more developed countries can be beneficial to both parties. Such cooperation should also allow the exchange and transfer of know-how through technical application projects. The participants also considered that international organizations could and should play an important role, by providing a higher-level institutional framework to cooperative projects and the necessary starting conditions, which often includes a limited amount of seed funding. (Detailed report contained in document A/AC.105/683.)

Title, location and date	*Sponsoring country/ organization (host institute)*	*(a) Funding and nature of support* *(b) Number of participating countries and organizations* *(c) Total number of participants*	*Outcome of activity*
United Nations/Israel International Workshop on Space Communications for Capacity Building Haifa, Israel 21-25 September 1997	Government of Israel and United Nations (S. Neaman Institute)	(a) Air travel and 20 per cent of DSA (United Nations and ESA), room and board (Government of Israel) for 13 participants, facilities, equipment and local transportation (S. Neaman Institute) (b) 19 countries and organizations (c) 72 participants	The main objective of the Workshop was to address the cost-benefit analysis of space projects and to formulate persuasive arguments pointing out the cost-effectiveness of space technology applications. Several examples of successful space applications, emphasizing the cost-benefit considerations of the projects, were presented. The participants suggested that an international advisory body on space technology should be appointed with the task of being a reference contact entity for developing countries willing to improve or implement space technology for their national use. This body should also look into the cost effectiveness of space-based solutions when compared with other terrestrially based solutions and assess the cost-benefit ratio of application projects. (Detailed report contained in document A/AC.105/684.)
United Nations/International Astronautical Federation Workshop on Space Technology as a Cost-Effective Tool to Improve Infrastructures in Developing Countries Turin, Italy 2-5 October 1997	Government of Italy, United Nations, European Commission, ESA and International Astronautical Federation (IAF) (Italian Space Agency)	(a) Air travel and DSA for 30 participants and other expenses (Italy, United Nations, European Commission, ESA and IAF) (b) 23 countries, 13 national and international organizations; and representatives from six companies (c) 120 participants	Discussions resulted in a set of recommendations and conclusions providing insight into how developing countries can most efficiently develop and strengthen their indigenous capabilities to maximize benefits from the use of space technology applications. It was suggested that an international advisory body on space technology should be appointed as a reference contact entity for developing countries willing to improve or implement space technology for their national use. This body should also look into the cost-effectiveness of space-based solutions when compared with other terrestrially based solutions and assess the cost-benefit ratio of applications projects. In addition, it may provide dedicated, integrated and easy-to-access information about know-how and previous case studies, as well as data source information about experts and value-added services provided by different companies in the different countries. (Detailed report contained in document A/AC.105/686.)
United Nations/European Space Agency/Committee on Space Research/Brazil Workshop on Data Analysis Techniques São José dos Campos, Brazil 10-14 November 1997	Government of Brazil, United Nations and ESA (Instituto Nacional de Pesquisas Espaciais)	(a) Air travel and subsistence for 17 participants (United Nations and ESA), additional support by other organizations as reflected in the report of the Workshop, facilities, equipment and local transportation (Brazil) (b) 20 countries (c) 50 participants	The Workshop provided a forum for educators and scientists concerned with access, analysis and interpretation of data from Earth observation satellites. Aspects of the use of software packages to pursue data management in remote sensing, satellite meteorology and astronomy were explored. The Workshop focused on software systems for image processing and data analysis to be recommended for use at the regional centres for space science and technology education (affiliated to the United Nations). (Detailed report contained in document A/AC.105/687.)

Title, location and date	*Sponsoring country/organization (host institute)*	*(a) Funding and nature of support* *(b) Number of participating countries and organizations* *(c) Total number of participants*	*Outcome of activity*
United Nations/ European Space Agency Training Course on Applications of European Remote Sensing Satellite Data for Natural Resources, Renewable Energy and the Environment, for English-speaking African countries Frascati, Italy 24 November- 5 December 1997	United Nations Trust Fund for New and Renewable Sources of Energy, Office for Outer Space Affairs and Department of Economic and Social Affairs (ESA/ESRIN)	(a) Air travel and DSA for 20 participants (United Nations); facilities and technical support (ESRIN) (b) 13 countries (c) 20 participants	The objectives of the Course were: (a) to provide participants with a theoretical basis and practical experience in various aspects of microwave remote sensing, focusing on the applications of that technology to natural resources, sources of renewable energy and, in particular, its use in conducting inventories and monitoring the environment; and (b) to familiarize the participants with the bibliography and archives of ERS materials and data that are available at the ESRIN facility at Frascati. Aspects of the Course also included the theory and the concepts of synthetic aperture radar image formation and an introduction to digital image processing of radar data in oceanographic, geologic, topographic and cartographic applications. Opportunities also were provided for the participants to make short presentations on the research or operational work that they were conducting at their home institutions. (Detailed report contained in A/AC.105/688.)

Annex VI

UNITED NATIONS PROGRAMME ON SPACE APPLICATIONS: SCHEDULE OF TRAINING COURSES, WORKSHOPS, CONFERENCES AND SYMPOSIA IN 1998

Activity number	*Activity*	*Date and place*	*Objective*
1	Workshop on Emerging Trends in Satellite Meteorology: Technology and Applications	9-12 March Ahmedabad, India	To initiate the nine-month course on satellite meteorology and global climate at the Centre for Space Science and Technology Education in Asia and the Pacific (affiliated to the United Nations)
2	(a) United Nations/Space System for Tracking Ships in Distress (COSPAS)/Search and Rescue Satellite Tracking System Workshop on Space Technology for Emergency Aid	16-18 April Maspalomas, Las Palmas, Canary Islands, Spain	To explore the use of the facilities of the International Satellite System for Search and Rescue (COSPAS-SARSAT) to address all applicable emergencies particularly in the developing countries and to bring to the Workshop the individuals responsible for emergencies and natural disaster programmes in their respective countries, especially in the countries that are covered by the Spanish Mission Control Centre.
	(b) Pre-UNISPACE III Regional Conference for Africa	21-25 September Tunis, Tunisia	Regional preparatory meetings for UNISPACE III are being organized in consultation with States of each region. The programme of these preparatory meetings (see annex I) contains elements from the annotated agenda of UNISPACE III. The outcome of the meetings will also serve as part of the input for UNISPACE III and its preparatory work.
3	Pre-UNISPACE III Regional Conference for Asia and the Pacific	18-22 May Kuala Lumpur, Malaysia	Same as activity 3 (b) above
4	Eighth United Nations/Sweden International Training Course on Remote Sensing Education for Educators	4 May-12 June Stockholm and Kiruna, Sweden	To develop the knowledge and skills of university educators in remote sensing technology and to equip the participants with an ability to introduce elements of the technology, as appropriate, in the academic curricula of their own universities and institutes.
5	United Nations Symposium on Economic Benefits of Applying Space Systems for Resources Planning, Education and Communication Infrastructure	7-10 September Graz, Austria	To continue the series of annual meetings held at Graz, which are designed to educate users and policy and decision makers on how developing countries can benefit from the use of space technology applications. Projects initiated or carried on by participants in previous symposia will be presented and lessons learned from implementing applications in the telecommunications and remote sensing fields will be discussed.

Activity number	*Activity*	*Date and place*	*Objective*
6	United Nations Workshop on Expanding the User Community of Space Technology in Developing Countries	24-27 September Melbourne, Australia	To continue the series of workshops that have been held in conjunction with the annual International Astronautical Federation Congress. The Workshop will specifically address the situation in the region of Asia and the Pacific. Discussions will focus on how the introduction and operational use of space technology applications can contribute to sustainable development of the region. As was the case at the 1997 Workshop, representatives from the space industry will be invited to contribute to the discussions and to meet with developing country participants to discuss possibilities for cooperation.
7	Workshop on the Evaluation of the United Nations/Sweden Courses Series on Remote Sensing Education for Educators	September/October (exact date to be determined) Gaborone, Botswana	To evaluate the impact of the United Nations/Sweden series of courses on remote sensing education for educators, held annually in Sweden since 1990 (except in 1991), and to determine the future direction of the course.
8	Regional Preparatory Conference for UNISPACE III (Latin America and the Caribbean)	October Santiago, Chile	Same as activity 3 (b) above.
9	COPINE Training Course in Africa	Date and place to be determined	To equip the operators of the COPINE facilities with necessary skills, particularly in operational requirements, maintenance and repair. User education, training and awareness-raising will be featured in the programme of the Workshop, as well as the strengthening of the many existing links and the establishment of new and long-term inter-institutional linkages that are supported by the COPINE project.